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PATENT & TRADEMARK OFFICE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/543,052
Filing Date	4/5/2000
First Named Inventor	Gopal Parupudi
Group Art Unit	2681
Examiner Name	ERIKA A GARY
Attorney Docket Number	MS1- 508US

Total Number of Pages in This Submission

ENCLOSURES (check all that apply)

- ☒ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment / Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Documents
- ☐ Response to Missing Parts/ Incomplete Application
  - ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s)
- ☐ After Allowance Communication to Group
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☒ Appeal Communication to Group ***(Appeal Notice, Brief, Reply Brief)***
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Other Enclosure(s) *(please identify below):*

Appeal Brief; return receipt postcard

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual Name	**Lance R. Sadler/Reg. No. 38605**
Signature	
Date	**November 21, 2005**

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Typed or printed name	**Cheryl Boies**		
Signature	Cheryl Boies	Date	November 21, 2005

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Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 500.00

Complete if Known	
Application Number	09/543,052
Filing Date	4/5/2000
First Named Inventor	Gopal Parupudi
Examiner Name	ERIKA A GARY
Art Unit	2681
Attorney Docket No.	MS1 -508US

METHOD OF PAYMENT (check all that apply)

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☑ Deposit Account Deposit Account Number: 12-0769 Deposit Account Name: Lee & Hayes, PLLC

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
_____ - 20 or HP =	_____ x	50 =	_____

HP = highest number of total claims paid for, if greater than 20

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
_____ - 3 or HP =	_____ x	200 =	_____

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims Fee ($)	Fee Paid ($)
_____	_____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
_____ - 100 =	_____ / 50 =	_____ (round **up** to a whole number) x	_____ =	_____

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other: Appeal Brief	$500.00

SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 38605	Telephone (509) 324-9256
Name (Print/Type)	Lance R. Sadler		Date 11/21/05

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EV697604944

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 09/543,052
Filing Date ..... April 5, 2000
Inventorship ..... Parupudi et al.
Applicant ..... Microsoft Corp.
Group Art Unit 2681
Examiner ..... Gary
Attorney's Docket No. MS1-508us
Title: "Context Aware Computing Devices Having a Common Interface and Related Methods"

APPEAL BRIEF

To: Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

From: Lance Sadler (Tel. 509-324-9256x226; Fax 509-323-8979)
Customer No. 22801

Pursuant to 37 C.F.R. §41.37, Applicant hereby submits an appeal brief for application 09/543,052, filed April 5, 2000, within the requisite time from the date of filing the Notice of Appeal. Accordingly, Applicant appeals to the Board of Patent Appeals and Interferences seeking review of the Examiner's rejections.

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(1) Real Party in Interest

The real party in interest is Microsoft Corporation, the assignee of all right, title and interest in and to the subject invention.

(2) Related Appeals and Interferences

Appellant is not aware of any other appeals, interferences, or judicial proceedings which will directly affect, be directly affected by, or otherwise have a bearing on the Board's decision to this pending appeal.

(3) Status of Claims

Claims 17-31, 33-41 and 43-59 stand rejected and are pending in the Application. Claims 17-31, 33-41 and 43-59 are appealed. Some of these claims were previously amended. Claims 1-16, 32, and 42 were previously canceled without prejudice. Claims 17-31, 33-41 and 43-59 are set forth in the Appendix of Appealed Claims on page 33.

(4) Status of Amendments

A Final Office Action was issued on May 24, 2005.

A Response to the Final Office Action was filed July 25, 2005. One claim was amended.

An Advisory Action was issued on August 10, 2005, indicating that the request for reconsideration had been considered but did not place the application in condition for allowance.

Appellant filed a Notice of Appeal on September 26, 2005 in response to the Advisory Action and the Final Office Action.

(5) Summary of Claimed Subject Matter

A concise explanation of each of the independent claims is included in this Summary section, including specific reference characters. These specific reference characters are examples of particular elements of the drawings for certain embodiments of the claimed subject matter and the claims are not limited to solely the elements corresponding to these reference characters.

With respect to independent claim 17, a computing device 130 comprises a computer-readable medium 134, a location service module 602 embodied on the computer-readable medium, and multiple different location providers 604 configured to receive information from one or more different sources of information 606 and process the information to provide location information to the location service module 602. The location service module 602 is configured to process the location information to provide a current device location. A hierarchical tree structure 200, 204 resides on the computer-readable medium 134 and comprises multiple nodes that are each assigned a unique identification. The nodes represent geographical divisions of the Earth and the location service module is configured to traverse at least some of the nodes to provide the current device location.

With respect to independent claim 34, a method of determining the location of a computing device comprises providing multiple location providers 604 that are configured to provide location information that pertains to a current location of

the computing device. Location information is received from the multiple location providers 604 using a common interface 700. Using the information that is received from the multiple location providers 604, a current device location is ascertained by using a hierarchical tree structure 200, 204 comprising multiple nodes that are each assigned a unique identification. The nodes represent geographical divisions of the Earth. The act of using is recited to comprise traversing at least some of the nodes to provide the current device location.

With respect to independent claim 41, one or more computer-readable media have computer-readable instructions thereon which, when executed by a hand-held mobile computing device 600, cause the hand-held mobile computing device to provide multiple different location providers 604 that are configured to provide location information that pertains to a current location of the computing device; receive location information from the multiple different location providers 604 using a common interface 700; and use the information that is received from the multiple location providers 604 to ascertain a current device location by traversing a hierarchical tree structure 200, 204 comprising multiple nodes that represent physical or logical entities in order to ascertain the current device location.

With respect to independent claim 43, a method of determining the location of a mobile computing device 600 comprises providing multiple different location providers 604 that are configured to provide location information that pertains to a current location of the computing device 600. One or more of the location providers 604 are monitored. A confidence parameter is assigned to location information that is provided by one or more providers. The confidence parameter

provides a measure of a provider's confidence in its location information. The location information and the confidence parameter are sent to a location service module 602 on the mobile computing device. The location service module 602 is configured to use the location information and the confidence parameter to ascertain a current device location. The location information is configured to be used by the location service module in conjunction with a hierarchical tree structure 200, 204 that resides on a computer-readable medium on the mobile computing device 600, to ascertain the current device location. The hierarchical tree structure 200, 204 comprises multiple nodes that are each assigned a unique identification. The nodes represent geographical divisions of the Earth and the location service module is configured to traverse at least some of the nodes to provide the current device location.

With respect to independent claim 52, a method of determining the location of a mobile computing device 600 comprises providing multiple different location providers 604 that are configured to provide location information that pertains to a current location of the computing device 600. One or more of the location providers 604 are monitored. An accuracy parameter is assigned to location information that is provided by one or more providers. The accuracy parameter provides a measure of the accuracy of a provider's location information. The location information and accuracy parameter are sent to a location service module 602 on the mobile computing device 600. The location service module 602 is configured to use the location information and the accuracy parameter to ascertain a current device location. The location information is configured to be used by the location service module 602 in conjunction with a hierarchical tree structure 200,

204 that resides on a computer-readable medium on the mobile computing device 600, to ascertain the current device location. The hierarchical tree structure 200, 204 comprises multiple nodes that are each assigned a unique identification. The nodes represent geographical divisions of the Earth and the location service module is configured to traverse at least some of the nodes to provide the current device location.

(6) Grounds of Rejection to be Reviewed on Appeal

Claims 17-19, 29, 33, 34, and 41 stand rejected under 35 U.S.C. §103(a) as being obvious over Merriam, U.S. Patent No. 6,401,051 (hereinafter "Merriam") in view of U.S. Patent No. 5,539, 992 to Wang (hereinafter "Wang").

Claims 17, 20-28, 30, 31, 34-41, and 43-59 stand rejected under 35 U.S.C. §103(a) as being obvious over Fitch et al., U.S. Patent Number 6,321,092 (hereinafter Fitch) in view of Wang.

(7) Argument

A. The rejection under 35 U.S.C. §103(a) over the combination of Merriam and Wang does not establish a *prima facie* case of obviousness.

Claims 17-19, 29, 33, 34, and 41 stand rejected under 35 U.S.C. §103(a) as being obvious over Merriam in view of Wang.

Applicant respectfully submits that the Office has not established a *prima facie* case of obviousness with respect to the combination of Merriam and Wang.

The §103 Standard

In making out a §103 rejection, the Federal Circuit has stated that when one or more reference or source of prior art is required in establishing obviousness, "it is necessary to ascertain whether the prior art *teachings* would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitutions or other modification." *In re Fine,* 5 USPQ 2d, 1596, 1598 (Fed. Cir. 1988). That is, to make out a prima facie case of obviousness, the references must be examined to ascertain whether the combined *teachings* render the claimed subject matter obvious. *In re Wood*, 202 USPQ 171, 174 (C.C.P.A. 1979).

Moreover, there is a requirement that there must be some reason, suggestion, or motivation *from the prior art*, as a whole, for the person of ordinary skill to have combined or modified the references. *See, In re Geiger,* 2 USPQ 2d 1276, 1278 (Fed. Cir. 1987). It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fritch,* 23 USPQ 2d 1780, 1784 (Fed. Cir. 1992).

A factor cutting against a finding of motivation to combine or modify the prior art is when the prior art *teaches away* from the claimed combination. A reference is said to teach away when a person or ordinary skill, upon reading the reference, would be led in a direction divergent from the path that the applicant took. *In re Gurley*, 31 USPQ 2d 1130, 1131 (Fed. Cir 1994).

The need for specificity pervades this authority. See, e.g., *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed").

In addition to the standard discussed above, the Office has provided a paper, available at the following link:

http://www.uspto.gov/web/menu/busmethp/busmeth103rej.htm

that describes proper and improper rejections made under §103(a). Particularly instructive is Example 17 that appears in Section V of the paper illustrating an improper §103(a) rejection which is based upon a proposed motivation that is simply too general and lacking in particularity. This example is reproduced below in its entirety for the Office's convenience:

> **V. Examples of Improper Rejection under 35 U.S.C. 103**
>
> Example 17: Improper rejection based upon hindsight - general motivation statement.
>
> **a. The claimed invention**
>
> The invention is drawn to a smart card containing a tracking mechanism, which tracks shopping preferences of consumers by recording the type, quantity, and dates of purchase for a pre-selected group of products. The smart card is useful in a system and method for introducing new and alternative products that are of the same type as products normally purchased by the shopper. The smart card records the shopper's purchases and submits an automatic notification to the shopper when a quantity threshold is achieved for the pre-selected products. This notification will encourage the consumer to consider alternative products by providing the

consumer incentives, such as a pricing discount, to purchase an alternative product.

Claim 1:

A method for using a smart card in a marketing analysis program designed to introduce new products, the method comprising the steps of:

storing product information on the smart card when said products are purchased by a consumer wherein said information including type, quantity and dates of the product purchased;

identifying for each product a threshold for each of said type, quantity and dates of products purchased;

determining an incentive for an alternative product based on said threshold; and

automatically notifying said consumer when said threshold is reached for a given product identified on the smart card and providing the consumer with said incentive, whereby the incentive encourages the consumer to consider alternative products.

b. Evidence

Reference A discloses smart card that tracks consumer preferences by recording the type, quantity, and dates of purchase of pre-selected products to determine trends in consumer purchases. The smart card is periodically read by a scanner to determine its contents for market analysis. In return for using the smart card and participating in the marketing program, the user is provided with free product coupons for products that are normally purchased by the shopper.

Reference B discloses a traditional consumer incentive program that provides coupons for the purchase of named products based upon the consumer's purchase of those same products to promote customer loyalty.

c. Poor statement of the rejection

Claim 1 is rejected under 35 U.S.C. 103 as being unpatentable over Reference A in view of Reference B. Reference A discloses the conventional use of a smart card to track consumer preferences and provide incentives. However, Reference A does not disclose the automatic notification to consumer providing incentives. Reference B discloses providing incentives to consumers to purchase the desired products. ***It would have been obvious to combine Reference A's smart card with***

Reference B's incentive to consumers because the combination would allow Reference A's smart card to be more efficient.

d. Analysis

The motivation, improve efficiency, is too general because it could cover almost any alteration contemplated of Reference A and does not address why this specific proposed modification would have been obvious. Additionally, there is nothing in either of references that would suggest automatically notifying the consumer when reaching a threshold nor is there anything in either reference that would suggest the notifying step. Finally, although Reference B teaches a traditional coupon scheme to promote customer loyalty, there is no suggestion, other than applicant's disclosure, to employ this scheme to promote the introduction of new and alternative products. **The rejection is improper.**

In addition, a modification proposed by the Office cannot render the reference unsatisfactory for its intended purpose. Further, the modification proposed by the Office cannot change a principle of operation of a reference. Specifically, MPEP §2143.01 entitled "Suggestion or Motivation To Modify the References" instructs as follows.

> THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE
>
> If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) (Claimed device was a blood filter assembly for use during medical procedures wherein both the inlet and outlet for the blood were located at the bottom end of the filter assembly, and wherein a gas vent was present at the top of the filter assembly. The prior art reference taught a liquid strainer for removing dirt and water from gasoline and other light oils wherein the inlet and outlet were at the top of the device, and wherein a pet-cock (stopcock) was located at the bottom of the device for periodically removing the collected dirt and water. The reference further taught that the separation is assisted by gravity. The Board concluded the claims were prima facie obvious, reasoning that it would have been obvious to turn the reference device upside down. The court reversed, finding that if the prior art device was turned upside down it would be inoperable for its intended purpose because the gasoline to be filtered would be trapped at the top, the water and heavier oils sought to be separated would flow

out of the outlet instead of the purified gasoline, and the screen would become clogged.).

"Although statements limiting the function or capability of a prior art device require fair consideration, simplicity of the prior art is rarely a characteristic that weighs against obviousness of a more complicated device with added function." In re Dance, 160 F.3d 1339, 1344, 48 USPQ2d 1635, 1638 (Fed. Cir. 1998) (Court held that claimed catheter for removing obstruction in blood vessels would have been obvious in view of a first reference which taught all of the claimed elements except for a "means for recovering fluid and debris" in combination with a second reference describing a catheter including that means. The court agreed that the first reference, which stressed simplicity of structure and taught emulsification of the debris, did not teach away from the addition of a channel for the recovery of the debris.).

THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959) (Claims were directed to an oil seal comprising a bore engaging portion with outwardly biased resilient spring fingers inserted in a resilient sealing member. The primary reference relied upon in a rejection based on a combination of references disclosed an oil seal wherein the bore engaging portion was reinforced by a cylindrical sheet metal casing. Patentee taught the device required rigidity for operation, whereas the claimed invention required resiliency. The court reversed the rejection holding the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate." 270 F.2d at 813, 123 USPQ at 352.).
MPEP § 2143.01

The Office's Attempted Combination of Merriam and Wang

In attempting to combine Merriam and Wang, the Office argues that Merriam discloses all the recited features of many of the claims, except for a hierarchical tree structure. The Office then relies on Wang and argues that Wang discloses a hierarchical tree structure.

Given these two references, the Office argues that their combination would render the subject matter of many of the claims obvious. In support of its argument, the Office argues that the motivation "would have been to more efficiently and precisely determine the current location of a device in a point of space on the earth." See, Office Action dated 5/24/2005, page 3.

For reasons that are discussed below in more detail, Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully submits that the Office has failed to establish a *prima facie* case of obviousness.

Consider, for example, the nature of Merriam's disclosure. Merriam pertains to a method and apparatus for locating buried objects prior to digging at a current location. As instructed by Merriam and perhaps best illustrated in Fig. 1, a positioning device 102 is taken to the location where digging is to take place. The positioning device receives positioning signals from one or more positioning stations 106, and based upon the positioning signals, determines the current location of the positioning device and hence the location of the dig site. This determination is made based upon positioning signals provided to the positioning device 102 by the positioning stations 106.

Once the current location is determined, a registry database 110 containing the locations of previously buried objects is accessed. The registry database is queried for all locations within a selected distance of the current location which have buried objects. If this query returns no records, then it is probably safe to dig at the current location. On the other hand, if the query returns one or more locations, then further digging at the current location should either be avoided or

performed with great caution. To aid in the digging process, a map of the area around the current position may be provided showing the locations of the previously buried objects. Regardless of whether there are buried objects within close proximity to the current location, if the digger decides to bury a new object at the current location, the current location is passed to the registry database and stored. This serves to update the database to include the new object so that future queries of the registry database will reveal the presence of the newly buried object. The registry database is thus populated and grown.

Merriam describes components of its system in a little more detail in FIGS. 2a and 2b, and the related discussion in the specification. There, positioning device 102 comprises, among other elements, a positioning system 218 comprising an input mechanism (such as a receiving mechanism) for receiving positioning signals from the positioning stations 106, a determining mechanism for determining a current location based upon the positioning signals, and an output mechanism for providing the current location to the processor 212. As instructed by Merriam, the positioning system 218 is one that is capable of determining a current location accurate to within several feet. Positioning systems 218 having this degree of granularity are currently commercially available. The Differential Global Positioning System manufactured by Trimble Navigation, Inc. of Sunnyvale, Calif., is an example of such a system.

Hence, what Merriam contemplates for purposes of determining its device's location is a GPS type of system or one that provides information that can be used to determine location to within an accuracy of several feet. That is, Merriam is concerned with and requires, for purposes of operability, information that allows it

to determine its location to within a few feet. For all intents and purposes, when Merriam's device's location is determined, it is static and immobile. In fact, it must be immobile in order to glean an accurate location reading in order to determine whether there are any buried objects that might present a hazard in the presence of digging.

Consider now Wang's disclosure. Wang describes a communication system that has a hierarchical system of nodes organized into multiple node trees (800-806, 820-826, and 835). The communication system is used for completing calls between various ports (810, 812, 826) for interfacing to various transceivers (840). The method used in the hierarchical system is capable of tracking the location of the transceiver as it moves between ports and trees of the system.

Perhaps a good starting point for a full appreciation of Wang is its "Background" section where Wang describes the problem that its invention addresses. Specifically, Wang instructs that a universal personal communication system is a system enabling anyone to communicate instantly with anyone else anywhere in the world. One of the crucial problems of such a system would be locating millions of moving customers in an efficient manner. The existing techniques for locating moving customers in the system are paging and registration using a central database. Considering the large number of customers in a global system, the first technique, if applied without knowledge of the location of the customers is impractical. The registration technique, which records all the movements of customers in a central database, is also impractical because the task of keeping track of such a huge number of users would be immense. Thus, a need

exists for a system for efficiently tracking customers in a universal personal communication system.

Furthermore, Wang instructs that frequency spectrum reuse is maximized by providing a communication system with cells as small as possible. However, for a moving customer, movement from cell to cell can cause extensive updating of a location data base. Additionally, communications systems such as a personal communication systems (PCS) having small cells coupled through a hierarchy of nodes must co-exist with existing communication systems during its establishment. The initial establishment of a complete hierarchy of nodes including national and global nodes may not be possible at the initial introduction of the system in some cases. Thus, according to Wang, what is needed is a method for connecting calls between developed hierarchical trees of the communication system when the trees are not related by hierarchical nodes.

Thus, characterized another way, Wang is concerned first and foremost with being able to efficiently track and locate moving customers that might move across a state, across a country, or throughout the world.

For an appreciation of Wang's approach, consider its Fig. 1 which shows a hierarchical structure for a communication system 100. The covered area of the communication system 100 is organized into a hierarchical structure having several layers. The highest layer may be the earth 102 followed by country 104, state 106, area code 108, city 110, and the lowest layer (Layer 1) is a primary layer that comprises a plurality of independent paging regions (cells) 112, each region defines an area or location in which one may be paged. Each layer 1 cell comprises one or more base stations. Layer 1 may comprise a radio telephone

communication system (e.g., Digital European Cordless Telephone). In the description that follows, Wang refers to layer 1 cells as base stations. Each region of layer "i" (except the lowest layer) consists of several regions of layer "i-1.".

Each block in layers 2 through 6 (the secondary layers) is a communication service node representing a switching station having computing and memory means (i.e., all layers >1 are intelligent layers). The memory means comprises a database for tracking the location of customers (i.e., users of portable communication units that are registered in the system).

In this system, as Wang instructs, an active customer does not necessarily communicate on the portable communication unit, but the movement of the portable communication unit is traced by the system. A customer is active when the power of the portable communication unit is on.

Referring to Wang's FIG. 5, a diagram illustrates an example of an address chain before moving, for a portable communication unit 24. In this example, the called party (unit 24) has a home address in cell 1,d, and a current address at cell 8,d. In a first case, the communication unit 20, located in cell 2,c, places a call to communication unit 24. The communication unit 20 merely dials the home address number of the called party. The calling party's connection request is received by a base station at cell 2,c, and it is passed on to the Boynton node in layer 2.

At the Boynton node, the corresponding database is searched for an entry relating to the called party. In this case an entry is found in the database. The entry contains the home address (HA) of the called party and an "OUT" indication. The call is then forwarded along the address chain to the "407" node of layer 3, where the database also contains the home address of the called party and an "OUT"

indication. Thus, the connection request is further traced up through the Florida node of layer 4, also indicating that the called party is "OUT". Then, in the U.S.A. node of layer 5 the database indicates that the portable 24 device is in Georgia. The tracing then continues to the Georgia node, where the area code "404" is indicated. Thereafter, the tracing process continues to the "404" node, where "Atlanta" is indicated. Searching in the Atlanta database reveals the precise location of the portable communication unit 24, and the requested connection is made.

Referring again to FIG. 5, in a second case the call for the called party is made from a calling communication unit 22 (also a portable in this example) located at cell 9,c. Accordingly, the call is received at the base station in cell 9,c, and is passed on to the Athens node in layer 2. There is no entry relating to the called party in the Athens database. Therefore, the connection request is passed on to the next node toward the home address of the called party (i.e., the "404" node). The database at the "404" node contains an entry (HA, Atlanta) indicating that the called party is in Atlanta. The connection request is accordingly passed on to the Atlanta node where the exact location of the portable 24 is determined to be in the 8,d cell, and the requested connection is made.

Thus, Wang pertains to and is primarily concerned with finding the locations of portable communication devices. In addition, the granularity with which Wang is concerned does not go to the level of several feet. Rather, the granularity is at the cell level—which is a region or area within which one may be paged. Wang further instructs that a cell area may be on the order of 20 kilometers.

The Office has not established a *prima facie* case of obviousness with regard to the combination of Merriam and Wang for at least the following five reasons: (1) the Office's stated motivation to combine the references (i.e. for efficiency) is simply too broad so as to support any modification of Merriam; (2) modifying Merriam to incorporate Wang's teachings would render Merriam unsatisfactory for its intended purpose; (3) modifying Merriam to incorporate Wang's teachings would change the principle of operation of Merriam; (4) Wang teaches directly away from the notion of a device determining its own location; and (5) the Office's combination of Merriam and Wang does not provide all of the elements of many of the claims.

With regard to the first reason the Office has failed to establish a *prima facie* case of obviousness, the Office's stated motivation to combine these references is simply too general and lacking in the type of particularity that would establish why a skilled artisan would have combined these references in the manner argued by the Office. In addition, it does not appear that Merriam suffers from any inefficiencies that would be solved by Wang's solution. That is, Merriam specifically states that "[p]ositioning systems 218 having this degree of granularity are currently commercially available. The Differential Global Positioning System manufactured by Trimble Navigation, Inc. of Sunnyvale, Calif., is an example of such a system." Hence, according to Merriam's own disclosure, using a GPS system is sufficient to enable its device to acquire information at the level of granularity that is necessary for it to function properly. That is, Merriam's discussion of the commercially available GPS-type systems does not state or even imply that there are any inefficiencies that require attention.

Hence, for at least this reason, the Office's stated motivation to combine Merriam and Wang is misplaced and inappropriate.

With regard to the second reason the Office has failed to establish a *prima facie* case of obviousness, modifying Merriam to incorporate Wang's teachings would render Merriam unsatisfactory for its intended purpose. Specifically, Merriam operates at the granularity of a few feet. This is necessary for it to adequately determine its location so that the presence of buried objects can be found. Wang, on the other hand, operates at the granularity of cell regions which, as indicated above, can be on the order of 20 kilometers. By incorporating Wang's teachings into Merriam's disclosure, Merriam would now be determining its location at the cell region level. This being the case, it would be impossible for Merriam's device to meaningfully determine the location of buried objects with the precision that is required for safe digging. Hence, making the Office's suggested combination would render Merriam unsatisfactory for its intended purpose.

With regard to the third reason the Office has failed to establish a *prima facie* case of obviousness, modifying Merriam to incorporate Wang's teachings would change the principle of operation of Merriam. That is, as it stands now, Merriam simply receives its location information from, for example, a GPS provider. This information contains all of the information that is needed for Merriam to operate. Modifying Merriam to adopt a hierarchical tree and to require a tree traversal to determine its location would require Merriam's principle of operation to change. In fact, it is unclear at best how or why one might do such a thing. Applicant respectfully submits that Merriam's system and method have no

need whatsoever for determining the precise location of its positioning device in a hierarchical tree structure that includes countries, states, and cities. Merriam's positioning device determines its current location and whether it is safe to dig at that current location. To do this, the device determines its current location and then sends this information to a central computer that searches a database to determine whether it is safe to dig at that particular location. After determining whether it is safe to dig at the current location, the central computer sends this information back to the device, and the user of the device can act accordingly.

It would be pointless as well as a waste of time and resources for Merriam's device to traverse a tree structure of nodes to determine its precise location in a hierarchical tree structure of nodes. For example, Merriam's device has no need to determine that its current location is in Seattle, which is in Washington, which is in the United States. The only thing that the device needs to know is whether there are any objects buried in close proximity to the current location.

With regard to the fourth reason the Office has failed to establish a *prima facie* case of obviousness, Wang teaches directly away from the notion of a device determining its own location. More specifically, Merriam's device determines its own location based on, for example, GPS data that it receives. It then conveys this information to a remote database which then checks to ascertain whether there are any buried objects at that location. Wang, on the other hand, employs a number of nodes (See, e.g. Fig. 5 and the discussion above) which individually maintain information associated with the location of a cell phone. It does not appear that Wang's cell phone plays any role in the location determination process other than, for example, providing an indication that it is in a particular cell region. It is this

indication that is then used by other remote computing devices to track the location of the cell phone. Hence, Wang teaches directly away from the notion of a computing device determining its own location.

With regard to the fifth reason the Office has failed to establish a *prima facie* case of obviousness, the combination of the references does not disclose all of the various claims' subject matter. That is, many of the independent claims recite that the hierarchical tree structure is in some way embodied on the computing device whose location is being determined. Yet, Wang's so-called hierarchical tree is not embodied on the computing device whose location is being determined. Accordingly, for those claims that recite that the hierarchical tree resides on the computing device whose location is being determined, the Office has not established a *prima facie* case of obviousness.

For each of or a sub-combination of the reasons mentioned above, the Office has failed to establish a *prima facie* case of obviousness with regard to the combination of Merriam and Wang.

Claims 17-19, 29, 33, 34, and 41

Claim 17 recites a computing device comprising:

- a computer-readable medium;
- a location service module embodied on the computer-readable medium; and
- multiple different location providers configured to receive information from one or more different sources of information and process the information to provide location information to the location service module,
- the location service module being configured to process the location information to provide a current device location***; and***

- ***a hierarchical tree structure that resides on the computer-readable medium, the hierarchical tree structure comprising multiple nodes that are each assigned a unique identification, the nodes representing geographical divisions of the Earth, the location service module being configured to traverse at least some of the nodes to provide the current device location.***

In making out the rejection of the claim, the Office argues that Merriam discloses all of the subject matter of the independent claim except for the hierarchical tree structure. For this feature, the Office relies on Wang and argues that its combination with Merriam would render the subject matter obvious. As a motivation for making this combination, the Office argues that the motivation would be to "more efficiently and precisely determine the current location of a device."

Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully submits, for the reasons mentioned above, that the Office has failed to establish a *prima facie* case of obviousness.

Claims 18, 19, 29 and 33 depend from claim 17 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 17, are neither disclosed nor suggested in the references cited and applied by the Office.

Claim 34 recites a method of determining the location of a computing device comprising:

- providing multiple location providers that are configured to provide location information that pertains to a current location of the computing device;

- receiving location information from the multiple location providers using a common interface;
- using the information that is received from the multiple location providers to ascertain a current device location ***by using a hierarchical tree structure comprising multiple nodes that are each assigned a unique identification, the nodes representing geographical divisions of the Earth, said act of using comprising traversing at least some of the nodes to provide the current device location***.

In making out the rejection of this claim, the Office makes the same argument and combination of Merriam and Wang. For at least reasons (1), (2) and (3) set forth above, the Office has failed to establish a *prima facie* case of obviousness. Accordingly, this claim is allowable.

Claim 41 recites one or more computer-readable media having computer-readable instructions thereon which, when executed by a hand-held mobile computing device, cause the hand-held mobile computing device to:

- provide multiple different location providers that are configured to provide location information that pertains to a current location of the computing device;
- receive location information from the multiple different location providers using a common interface; and
- use the information that is received from the multiple location providers to ascertain a current device location ***by traversing a hierarchical tree structure comprising multiple nodes that represent physical or logical entities in order to ascertain the current device location.***

In making out the rejection of this claim, the Office makes the same argument and combination of Merriam and Wang. For the reasons set forth above,

the Office has failed to establish a *prima facie* case of obviousness. Accordingly, this claim is allowable.

B. The rejection under 35 U.S.C. §103(a) over the combination of Fitch and Wang does not establish a *prima facie* case of obviousness.

Claims 17, 20-28, 30, 31, 34-41, and 43-59 stand rejected under 35 U.S.C. §103(a) as being obvious over Fitch et al., U.S. Patent Number 6,321,092 (hereinafter Fitch) in view of Wang.

Applicant respectfully submits that the Office has not established a *prima facie* case of obviousness with respect to the combination of Fitch and Wang.

The Office's Attempted Combination of Fitch and Wang

Similarly, in attempting to combine Fitch and Wang, the Office argues that Fitch discloses all recited features of many of the claims except for a hierarchical tree structure. The Office then relies on Wang and argues that Wang discloses a hierarchical tree structure.

Given these two references, the Office argues that their combination would render the subject matter of many of the claims obvious. In support of its argument, the Office argues that the combination would be motivated to more efficiently and precisely determine the current location of a device in a point of space on the earth. See, Office Action dated 5/24/2005, page 4.

Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully submits that the Office has failed to establish a *prima facie* case of obviousness.

Consider, for example, the nature of Fitch's disclosure. Fitch pertains to a system for managing multiple inputs for location-based applications. As Fitch instructs, multiple location finding equipment (LFE) inputs are used to enhance the location information made available to wireless location-based applications. Fitch's system includes, as shown in Fig. 1, a wireless network including a mobile switching center or MSC 112 for use in routing communications to or from wireless stations 102, a network platform 114 associated with the MSC 112, and a variety of location finding equipment or LFE systems 104, 106, 108 and 110. A Location Finding System or LFS 116 resides on the platform 114. The LFS 116 receives location information from the LFEs 104, 106, 108 and 110 and provides location information to wireless location based applications 118. In this regard, the LFS 116 can receive input information at varying time intervals of varying accuracies and in various formats, and can provide standardized outputs to the applications 118, for example, depending on the needs of the applications 118.

Fitch further describes the various location finding technologies that can be utilized to ascertain locations starting in column 6 at line 40. Specifically, Fitch instructs that a number of different location finding technologies are depicted in its FIGS. 3a-3d.

FIG. 3a generally shows the coverage area 300 of a cell sector. As noted above, the cell site equipment for a particular cell of a wireless telecommunications system may include a number, e.g., three or more, of directional antennas. Each antenna thus covers an angular range relative to the cell site bounded by sides 302. In the case of a three sector cell, each antenna may cover about 120.degree.-150.degree. relative to the cell site. In addition the

coverage range for the antenna defines an outer perimeter 304 of the coverage area 300. As shown, the range varies with respect to angle defining a somewhat jagged outer perimeter 304. Accordingly, the actual uncertainty regarding the location of a wireless station located in the illustrated cell sector is defined by the coverage area 300. The location determination output from a cell/sector LFE is therefore effectively defined by the coordinates of the coverage area 300.

FIG. 3b depicts a TOA based LFE. In this case, the wireless station's range from a cell sector antenna is determined, based on time of signal arrival or signal transit time to within a radius range, e.g., about 1000 meters. Accordingly, the wireless station's location can be determined to be within an area bounded by sides 306 (based on the angular range of the cell sector antenna) and inner 308 and outer 310 arcs (defined by the ranging uncertainty). The output from a TOA based LFE is effectively defined by the coordinates of the sides 306 and the axes 308 and 310.

An AOA based LFE is generally illustrated in FIG. 3c. AOA based LFEs determine the location of a wireless station based on the angle of arrival of signals, generally indicated by rays 312 and 314, from the wireless station as measured by two or more cell sites 316 and 318. Each angle measurement has an angular uncertainty generally indicated by line segments 320 and 322. Consequently, the uncertainty region for a given location determination is defined by a polygon having 2n sides, where n is the number of cell sites 316 and 318 involved in the measurement.

FIG. 3d illustrates a TDOA based LFE although the illustrated system is cell site based, the TDOA system may alternatively be handset based. In TDOA systems, multiple cell sites measure the time of arrival of signals from a wireless

station. Based on such measurements, each cell site can provide information regarding wireless station location in terms of a hyperbola 324 or 326 and an uncertainty, generally indicated by segments 328 and 330. The resulting uncertainty region is defined by a multi-sided region (where each wall is curved) having 2n walls, where n is the number of cell sites involved in the determination.

FIG. 3e illustrates a GPS based LFE. In GPS systems, the wireless station includes a GPS transceiver for receiving signals indicating the wireless station's location relative to multiple satellites in the GPS constellation. Based on these signals, the geographic coordinates of the wireless station's location is determined to an accuracy of perhaps 20 meters as generally indicated by circle 332. This information is then transmitted to the wireless network across an air interface.

The Office has not established a *prima facie* case of obviousness with regard to the combination of Fitch and Wang for at least the following three reasons or a sub-combination thereof: (1) the Office's stated motivation to combine the references (i.e. for efficiency and precision) is simply too broad so as to support any modification of Fitch; and (2) the combination of the references does not disclose all of the various claims' subject matter; and (3) Wang teaches directly away from the notion of a device determining its own location.

With regard to the first reason the Office has failed to establish a *prima facie* case of obviousness, the Office's stated motivation to combine the references (i.e. for efficiency and precision) is simply too broad so as to support any modification of Fitch. Specifically, the Office's stated motivation to combine these references is simply too general and lacking in the type of particularity that would establish why a skilled artisan would have combined these references in the

manner argued by the Office. In addition, it does not appear that Fitch suffers from any inefficiencies that would be solved by Wang's solution. Specifically, Fitch describes a number of different location finding technologies that can be used in its implementation. It does not appear that collectively, the agglomeration of these technologies suffers from any inefficiency that Wang could solve. Hence, not only is the motivation stated by the Office too broad and general, the motivation in and of itself is misplaced.

With regard to the second reason the Office has failed to establish a *prima facie* case of obviousness, the combination of the references does not disclose all of the subject matter of at least some of the claims. That is, many of the independent claims recite that the hierarchical tree structure is in some way embodied on the computing device whose location is being determined. Yet, Wang's so-called hierarchical tree is not embodied on the computing device whose location is being determined. Accordingly, for those claims that recite that the hierarchical tree resides on the computing device whose location is being determined, the Office has not established a *prima facie* case of obviousness.

With regard to the third reason the Office has failed to establish a *prima facie* case of obviousness, Wang teaches directly away from the notion of a device determining its own location. That is, in Wang, it is not the computing device itself (i.e. the cell phone) that is determining its location. Rather, other computing devices associated with Wang's nodes do the location determination. Accordingly, Wang teaches directly away from the notion of a computing device determining its own location.

Accordingly, for at least these reasons or a sub-combination thereof, the Office has failed to establish a *prima facie* case of obviousness with regard to the combination of Fitch and Wang.

Claims 17, 20-28, 30, 31, 34-41, and 43-59

In rejecting **claim 17**, the Office makes a similar argument as it did above regarding the combination between Merriam and Wang. The Office argues that Fitch discloses all recited features except for a hierarchical tree structure. The Office then relies on Wang and argues that Wang discloses a hierarchical tree structure.

Given these two references, the Office again argues that their combination would render the subject matter obvious. In support of its argument, the Office argues that the skilled artisan would have readily recognized the desirability and advantage of modifying Fitch by employing the system of Wang in order to more efficiently and precisely determine the current location of a device in a point of space on the earth.

For the reasons mentioned above, the Office has failed to establish a *prima facie* case of obviousness, and the claim is allowable.

Claims 20-28, 30, 31 and 33 depend from claim 17 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 17, are neither disclosed nor suggested in the references cited and applied by the Office.

In making out the rejection of **claim 34**, the Office makes the same argument and combination of Fitch and Wang as it did with claim 17. For at least

the reason that the Office's stated motivation in making its combination is too general and lacking in particularity, the Office has failed to establish a *prima facie* case of obviousness. Accordingly, this claim is allowable.

Claims 35-40 depend from claim 34 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 34, are neither disclosed nor suggested in the references cited and applied by the Office.

In making out the rejection of **claim 41**, the Office makes the same argument and combination of Fitch and Wang as it did with claim 17. For the reasons set forth above, the Office has failed to establish a *prima facie* case of obviousness. Accordingly, this claim is allowable.

In making out the rejection of **claim 43**, the Office makes the same argument and combination of Fitch and Wang as it did with claim 17. For the reasons set forth above, the Office has failed to establish a *prima facie* case of obviousness. Accordingly, this claim is allowable.

Claims 44-51 depend from claim 43 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 43, are neither disclosed nor suggested in the references cited and applied by the Office.

In making out the rejection of **claim 52**, the Office makes the same argument and combination of Fitch and Wang as it did with claim 17. For the reasons set forth above, the Office has failed to establish a *prima facie* case of obviousness. Accordingly, this claim is allowable.

Claims 53-59 depend from claim 52 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 52, are neither disclosed nor suggested in the references cited and applied by the Office.

Conclusion

The Office's basis and supporting rationale for the § 103(a) rejections is not supported by the teaching of the cited references. Applicant respectfully requests that the rejections be overturned and that the pending claims be allowed to issue.

Respectfully Submitted,

Dated: 11/21/05

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(8) Appendix of Appealed Claims

17. (Previously Presented) A computing device comprising:

a computer-readable medium;

a location service module embodied on the computer-readable medium; and

multiple different location providers configured to receive information from one or more different sources of information and process the information to provide location information to the location service module,

the location service module being configured to process the location information to provide a current device location; and

a hierarchical tree structure that resides on the computer-readable medium, the hierarchical tree structure comprising multiple nodes that are each assigned a unique identification, the nodes representing geographical divisions of the Earth, the location service module being configured to traverse at least some of the nodes to provide the current device location.

18. (Original) The computing device of claim 17 embodied as a mobile computing device.

19. (Original) The computing device of claim 17 embodied as a desktop computing device.

20. (Original) The computing device of claim 17, wherein one or more of the location providers are configured to self-monitor their operation and to inform the location service module of an operation irregularity.

21. (Original) The computing device of claim 17, wherein one or more of the location providers are configured to assign confidence parameters to the information that is provided to the location service module, the confidence parameters providing a measure of a provider's confidence in the information.

22. (Original) The computing device of claim 17, wherein one or more of the location providers are configured to assign accuracy parameters to the information that is provided to the location service module, the accuracy parameters providing a measure of the accuracy of a provider's information.

23. (Original) The computing device of claim 17, wherein one or more of the location providers are configured to:

assign confidence parameters to the information that is provided to the location service module, the confidence parameters providing a measure of a provider's confidence in the information; and

assign accuracy parameters to the information that is provided to the location service module, the accuracy parameters providing a measure of the accuracy of a provider's information.

24. (Original) The computing device of claim 17, wherein one or more of the location providers are configured to continuously update information that is provided to the location service module.

25. (Original) The computing device of claim 17, wherein one or more of the location providers are configured to periodically update information that is provided to the location service module.

26. (Original) The computing device of claim 25, wherein the one or more location providers are configured to update the information at specified times.

27. (Original) The computing device of claim 25, wherein the one or more location providers are configured to update the information on the occurrence of specified events.

28. (Original) The computing device of claim 17, wherein one or more of the location providers are configured to receive a request from the location service module and update the information that is provided to the location service module based on the request.

29. (Original) The computing device of claim 17, wherein the computing device comprises a hand-held mobile computing device.

30. (Original) The computing device of claim 17, wherein the computing device is configured to accommodate dynamically adding or removing one or more location providers.

31. (Original) The computing device of claim 17, wherein the computing device is configured to continue operation when one or more of the location providers stops functioning.

33. (Previously Presented) The computing device of claim 17, wherein one or more of the location providers are configured to process the information and provide the unique identification for one of the nodes of the hierarchical tree structure.

34. (Previously Presented) A method of determining the location of a computing device comprising:

providing multiple location providers that are configured to provide location information that pertains to a current location of the computing device;

receiving location information from the multiple location providers using a common interface;

using the information that is received from the multiple location providers to ascertain a current device location by using a hierarchical tree structure comprising multiple nodes that are each assigned a unique identification, the nodes representing geographical divisions of the Earth, said act of using comprising traversing at least some of the nodes to provide the current device location.

35. (Original) The method of claim 34, wherein the common interface accommodates multiple location providers that are different.

36. (Original) The method of claim 34, wherein the receiving of the location information comprises continuously receiving location information from at least one of the location providers.

37. (Original) The method of claim 34, wherein the receiving of the location information comprises periodically receiving location information from at least one of the location providers.

38. (Original) The method of claim 37, wherein the receiving of the information comprises receiving the information at specific times.

39. (Original) The method of claim 37, wherein the receiving of the information comprises receiving the information on the occurrence of specific events.

40. (Original) The method of claim 37, wherein the receiving of the information comprises receiving the information responsive to a request to receive the information.

41. (Previously Presented) One or more computer-readable media having computer-readable instructions thereon which, when executed by a hand-held mobile computing device, cause the hand-held mobile computing device to:

provide multiple different location providers that are configured to provide location information that pertains to a current location of the computing device;

receive location information from the multiple different location providers using a common interface; and

use the information that is received from the multiple location providers to ascertain a current device location by traversing a hierarchical tree structure comprising multiple nodes that represent physical or logical entities in order to ascertain the current device location.

43. (Previously Presented) A method of determining the location of a mobile computing device comprising:

providing multiple different location providers that are configured to provide location information that pertains to a current location of the computing device;

monitoring one or more of the location providers;

assigning a confidence parameter to location information that is provided by one or more providers, the confidence parameter providing a measure of a provider's confidence in its location information;

sending the location information and the confidence parameter to a location service module on the mobile computing device, the location service module being configured to use the location information and the confidence parameter to ascertain a current device location;

wherein said location information is configured to be used by the location service module in conjunction with a hierarchical tree structure that resides on a computer-readable medium on the mobile computing device, to ascertain the current device location, the hierarchical tree structure comprising multiple nodes

that are each assigned a unique identification, the nodes representing geographical divisions of the Earth, the location service module being configured to traverse at least some of the nodes to provide the current device location.

44. (Original) The method of claim 43 further comprising assigning an accuracy parameter to the location information that is provided by one or more providers, the accuracy parameter providing a measure of the accuracy of a provider's location information.

45. (Original) The method of claim 43 further comprising responsive to the monitoring, notifying the location service module upon the occurrence of an operation irregularity.

46. (Original) The method of claim 43 further comprising receiving a location query and responding to the query with a location provider.

47. (Original) The method of claim 43, wherein one or more of the location providers are configured to continuously send the location information to the location service module.

48. (Original) The method of claim 43, wherein one or more of the location providers are configured to periodically send the location information to the location service module.

49. (Original) The method of claim 48, wherein the one or more location providers are configured to send the location information at specified times.

50. (Original) The method of claim 48, wherein the one or more location providers are configured to send the location information on the occurrence of specified events.

51. (Original) One or more computer-readable media having computer-readable instructions thereon which, when executed by a mobile computing device, implement the method of claim 43.

52. (Previously Presented) A method of determining the location of a mobile computing device comprising:

providing multiple different location providers that are configured to provide location information that pertains to a current location of the computing device;

monitoring one or more of the location providers;

assigning an accuracy parameter to location information that is provided by one or more providers, the accuracy parameter providing a measure of the accuracy of a provider's location information;

sending the location information and accuracy parameter to a location service module on the mobile computing device, the location service module being configured to use the location information and the accuracy parameter to ascertain a current device location;

wherein said location information is configured to be used by the location service module in conjunction with a hierarchical tree structure that resides on a computer-readable medium on the mobile computing device, to ascertain the current device location, the hierarchical tree structure comprising multiple nodes that are each assigned a unique identification, the nodes representing geographical divisions of the Earth, the location service module being configured to traverse at least some of the nodes to provide the current device location.

53. (Original) The method of claim 52 further comprising, responsive to the monitoring, notifying the location service module on the occurrence of an operation irregularity of a location provider.

54. (Original) The method of claim 52 further comprising receiving a location query and responding to the location query with the location provider.

55. (Original) The method of claim 52, wherein one or more of the location providers continuously send location information to the location service module.

56. (Original) The method of claim 52, wherein one or more of the location providers periodically send location information to the location service module.

57. (Original) The method of claim 56, wherein the one or more location providers send the location information at specified times.

58. (Original) The method of claim 56, wherein the one or more location providers send the location information on the occurrence of specified events.

59. (Original) One or more computer-readable media having computer-readable instructions thereon which, when executed by a mobile computing device, implement the method of claim 52.